

fractions Sideways, I tried what would be the Effects of such a second Refraction. For this end I ordered all things as in the third Experiment, and then placed a second Prism immediately after the first in a cross Position to it, that it might again refract the beam of the Sun's Light which came to it through the first Prism. In the first Prism this beam was refracted upwards, and in the second Sideways. And I found that by the Refraction of the second Prism the breadth of the Image was not increased, but its superior part which in the first Prism suffered the greater Refraction and appeared violet and blew, did again in the second Prism suffer a greater Refraction than its inferior part, which appeared red and yellow, and this without any Dilation of the Image in breadth.

Fig. 14. Illustration. Let S represent the Sun, F the hole in the Window, A B C the first Prism, D H the second Prism, Y the round Image of the Sun made by a direct beam of Light when the Prisms are taken away, P T the oblong Image of the Sun made by that beam passing through the first Prism alone when the second Prism is taken away, and *pt* the Image made by the cross Refractions of both Prisms together. Now if the Rays which tend towards the several Points of the round Image Y were dilated and spread by the Refraction of the first Prism, so that they should not any longer go in single Lines to single Points, but that every Ray being split, shattered, and changed from a Linear Ray to a Superficies of Rays diverging from the Point of Refraction, and lying in the Plane of the Angles of Incidence and Refraction, they should go in those Planes to so many Lines reaching almost from one end of the Image P T to the other, and if that Image should thence become oblong: those Rays and their several parts tending towards the several Points of the

the Image P T ought to be again dilated and spread Sideways by the transverse Refraction of the second Prism, so as to compose a foursquare Image, such as is represented at *πl*. For the better understanding of which, let the Image P T be distinguished into five equal Parts P Q K, K Q R L, L R S M, M S V N, N V T. And by the same irregularity that the Orbicular Light Y is by the Refraction of the first Prism dilated and drawn out into a long Image P T, the the Light P Q K which takes up a space of the same length and breadth with the Light Y ought to be by the Refraction of the second Prism dilated and drawn out into the long Image *π q k p*, and the Light K Q R L into the long Image *k q r l*, and the Lights L R S M, M S V N, N V T into so many other long Images *l r s m*, *m s v n*, *n v t l*; and all these long Images would compose the foursquare Image *πl*. Thus it ought to be were every Ray dilated by Refraction, and spread into a triangular Superficies of Rays diverging from the Point of Refraction. For the second Refraction would spread the Rays one way as much as the first doth another, and so dilate the Image in breadth as much as the first doth in length. And the same thing ought to happen, were some Rays casually refracted more than others. But the Event is otherwise. The Image P T was not made broader by the Refraction of the second Prism, but only became oblique, as 'tis represented at *p t*, its upper end P being by the Refraction translated to a greater distance than its lower end T. So then the Light which went towards the upper end P of the Image, was (at equal Incidences) more refracted in the second Prism than the Light which tended towards the lower end T, that is the blew and violet, than the red and yellow; and therefore was more Refrangible. The same Light was by the Refraction of the first Prism translated further from the

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